2014 ALMOND DROUGHT SURVEY SUPPLEMENTAL RELEASE

California Department of Food and Agriculture

Cooperating with the USDA, National Agricultural Statistics Service
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IN THIS REPORT:

At the request of the California Almond Board, the USDA's National Agricultural Statistics Service (NASS) prepared this supplemental release to the September 4, 2014 release to portray a clearer picture of the results of the 2014 Almond Drought Survey.

An additional summary category, operations with less than 600 acres, was added. The report was reformatted to highlight instances where a summary table was dependent on the response to the previous question. Table 1D was re-summarized to reflect corrections to the initial summary report. The re-summarization to create the less than 600 almond acres category resulted in minor adjustments from the original release. Finally, Appendix A, Coefficient of Variation, was added to show the relative sampling error associated with the estimates.

A stratified random sample design was utilized for this survey. All known almond operations were categorized into subgroups or strata and a sample of 688 operations were randomly selected. Data collection included an initial mailing to sampled operations followed by telephone calls to operations that did not respond by mail. Responses were received from 458 operations resulting in 420 useable reports.

This report summarizes the survey results at 3 levels: farms with less than 600 almond acres, farms with 600 or more almond acres, and at the overall State level. Items may not add to 100 percent in some instances where the response was missing. Responses were summarized for those who operated almond acreage in 2014. If a sampled operation did not have any almond acreage in 2014, it was not included in the survey results. For example, if an operation was out of business or had their entire almond acreage removed or abandoned prior to 2014, it was not included in the survey results.

SECTION 1 - SURFACE WATER SUPPLY

TABLE 1: Does this almond operation utilize surface water for crop irrigation?

	Yes	No
Farms with Less than 600 Almond Acres	61.2%	38.1%
Farms with 600 or More Almond Acres	74.6%	25.4%
State Total	**61.8%**	**37.6%**

For respondents who answered **Yes** to utilizing surface water for crop irrigation:

TABLE 1A: Across all of this operation's almond orchards, approximately how much surface water do you receive and apply on average in **non-drought years**?

	Acre Inches/Acre
Farms with Less than 600 Almond Acres	30.8
Farms with 600 or More Almond Acres	31.5
State Total	**30.9**

SECTION 1 - SURFACE WATER SUPPLY *continued*

For respondents who answered **Yes** to utilizing surface water for crop irrigation:

TABLE 1B: Across all of this operation's almond orchards, do you expect to be supplied less surface water between February 2014 and October 2014 than the amount supplied during the same time period in 2013?

	Yes	No
Farms with Less than 600 Almond Acres	78.7%	18.6%
Farms with 600 or More Almond Acres	86.1%	12.1%
State Total	**79.0%**	**18.3%**

TABLE 1C: How many inches per acre less are expected to be supplied between February 2014 and October 2014 compared to the same time period in 2013?

	Acre Inches/Acre
Farms with Less than 600 Almond Acres	16.6
Farms with 600 or More Almond Acres	22.6
State Total	**16.9**

TABLE 1D: For this operation's total surface water supply in 2014, what percent is supplied by

	State (SWP)	Federal (CVP)	Private or Local Irrigation District (non SWP & CVP water)
Farms with Less than 600 Almond Acres	3.9%	9.3%	86.9%
Farms with 600 or More Almond Acres	15.5%	45.3%	39.2%
State Total	**4.4%**	**11.0%**	**84.5%**

SECTION 2 - GROUNDWATER SUPPLY

TABLE 2: Does this almond operation use groundwater for crop irrigation?

	Yes	No
Farms with Less than 600 Almond Acres	68.9%	29.6%
Farms with 600 or More Almond Acres	87.4%	12.6%
State Total	**69.7%**	**28.9%**

For respondents who answered **Yes** to using groundwater for crop irrigation:

TABLE 2A: Across all of this operation's almond orchards, approximately how much groundwater do you pump and apply on average in **non-drought years**?

	Acre Inches/Acre
Farms with Less than 600 Almond Acres	25.3
Farms with 600 or More Almond Acres	25.7
State Total	**25.3**

TABLE 2B: Do you believe the production from this operation's wells will supply 100% of the water needed for this operation's almond acreage between February 2014 and October 2014?

	Yes	No
Farms with Less than 600 Almond Acres	68.0%	27.0%
Farms with 600 or More Almond Acres	57.8%	42.2%
State Total	**67.4%**	**27.8%**

TABLE 2C: In 2014, what percent of the water used to irrigate this operation's almonds will come from wells?

	Percentage from Wells
Farms with Less than 600 Almond Acres	79.6%
Farms with 600 or More Almond Acres	82.4%
State Total	**79.8%**

TABLE 2D: Will this operation pump more groundwater between February 2014 and October 2014 than it did during same period in 2013?

	Yes	No
Farms with Less than 600 Almond Acres	51.4%	46.2%
Farms with 600 or More Almond Acres	64.4%	33.1%
State Total	**52.0%**	**45.5%**

TABLE 2E: How much more water will this operation pump between February 2014 and October 2014 than it did during the same period in 2013?

	Acre Inches/Acre
Farms with Less than 600 Almond Acres	14.5
Farms with 600 or More Almond Acres	19.0
State Total	**14.7**

SECTION 2 - GROUNDWATER SUPPLY *continued*

For respondents who answered **Yes** to using groundwater for crop irrigation:

TABLE 2F: Has this operation had to do any of the following in the past year, or scheduled to complete the following in the coming months, to access more groundwater for its almond acreage due to the current drought?

	Drill a new irrigation well		**Recondition an existing well (e.g., deepen or lower bowls)**	
	Yes	**No**	**Yes**	**No**
Farms with Less than 600 Almond Acres	20.8%	76.1%	30.8%	68.1%
Farms with 600 or More Almond Acres	53.4%	43.4%	63.1%	35.3%
State Total	**22.5%**	**74.5%**	**32.5%**	**66.5%**

TABLE 2G: Across all of this operation's almond orchards, what is the current average depth to water for all of its irrigation wells?

	Feet
Farms with Less than 600 Almond Acres	167
Farms with 600 or More Almond Acres	253
State Total	**171**

SECTION 3 - GROUNDWATER QUALITY

For respondents who answered **Yes** to using groundwater for crop irrigation:

TABLE 3: Across this operation's almond orchards, is the salinity of the groundwater in excess of the amount recommended for irrigation of almonds?

	Yes	No
Farms with Less than 600 Almond Acres	17.0%	79.6%
Farms with 600 or More Almond Acres	39.4%	59.1%
State Total	**18.1%**	**78.5%**

For respondents who answered **Yes** indicating excess salinity in groundwater for irrigation of almonds:

TABLE 3A: What percent of this operation's current groundwater supply is higher in salinity than the recommended amount for irrigation of almonds?

	Higher in Salinity than Recommended
Farms with Less than 600 Almond Acres	74.9%
Farms with 600 or More Almond Acres	52.1%
State Total	**73.8%**

TABLE 3B: Did this operation experience, or does it expect to experience, a negative impact on tree health or harvest quantity/quality in 2014 due to the application of high saline groundwater?

	Yes	No
Farms with Less than 600 Almond Acres	78.8%	21.2%
Farms with 600 or More Almond Acres	60.3%	39.7%
State Total	**77.9%**	**22.1%**

SECTION 4 - TREE REMOVAL

TABLE 4: Excluding normal removals due to tree age (old trees with declining production), has this operation removed trees within the last 6 months, or does it intend to remove trees in the next 6 months, due solely to the lack of sufficient water availability, or water quality, such as high saline content?

	Yes	No
Farms with Less than 600 Almond Acres	9.1%	89.5%
Farms with 600 or More Almond Acres	16.4%	82.3%
State Total	**9.4%**	**89.2%**

For respondents who answered **Yes** to removing trees due to drought or poor water quality:

TABLE 4A: What percent of acres, as a percent of this operations total almond acreage, has this operation removed, or planned to remove, before August 2014 as a result of the current drought, lack of water supply, or water quality?

	Percent of Acres
Farms with Less than 600 Almond Acres	38.7%
Farms with 600 or More Almond Acres	17.4%
State Total	**37.8%**

SECTION 5 - FUTURE NEW PLANTINGS

TABLE 5: Due to the current drought, has this operation decided to delay replanting of acreage that was removed due to the drought (lack of water supply or quality)?

	Yes	No
Farms with Less than 600 Almond Acres	9.8%	87.1%
Farms with 600 or More Almond Acres	23.2%	74.1%
State Total	**10.4%**	**86.6%**

Due to the current drought, has this operation decided to delay expanding or planting of new almond ground, either virgin ground or ground normally used for annual crops grown by this operation?

	Yes	No
Farms with Less than 600 Almond Acres	20.1%	77.7%
Farms with 600 or More Almond Acres	38.0%	60.6%
State Total	**20.8%**	**77.1%**

Appendix A.
Coefficient of Variation (CV)

A measure of sampling error is the coefficient of variation (CV) described below. The coefficient of variation is a measure of the relative error associated with the sample estimates and describes the standard error (SE) as a percent of the estimate (E). The CV allows the reliability of estimates to be compared; the lower the CV, the more reliable the estimate. For example, an approximate 95 percent confidence interval is calculated as the estimate $\pm$ 2 multiplied by the product of the CV and E. The table below shows the coefficients of variation calculated as a percent for each estimate in the summary tables.

$$CV = \frac{SE}{E} * 100$$

ALMOND DROUGHT SURVEY DATA: COEFFICIENT OF VARIATION (CV) BY TABLE

Table	Page	2 to 599 Acres	600 Acres and over	State
		Percent		
1	1	6.0	9.0	5.7
1A	1	4.3	5.5	4.1
1B	2	5.1	8.0	4.8
1C	2	6.2	6.8	5.9
1D SWP	2	41.1	26.9	34.6
1D CVP	2	28.5	14.7	23.1
1D Irrigation District	2	3.6	16.8	3.6
2	3	5.2	6.8	4.9
2A	3	7.6	7.5	7.2
2B	3	6.1	13.4	5.9
2C	3	3.5	3.3	3.4
2D	3	8.7	12.4	3.4
2E	3	12.0	8.5	11.2
2F Drill New Well	4	16.2	13.2	14.3
2F Recondition Existing	4	12.8	11.9	11.5
2G	4	6.9	7.5	6.4
3	5	19.3	17.4	17.2
3A	5	11.9	12.9	11.5
3B	5	12.2	27.1	11.7
4	6	23.9	28.9	22.2
4A	6	34.3	22.0	33.7
5 Delay Replanting	7	22.0	22.1	20.1
5 Delay Expansion	7	14.7	16.5	13.7